

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900004-6

MALYSHEV, I. F., KOMAR, E. G., MIKHELIS, Ya.L., POPKOVICH, A. V.

"Vacuum Chamber of the 10 GeV Synchrotron Electromagnet,"
paper presented at CERN Symposium, 1956, appearing in Nuclear
Instruments, No. 1, pp. 21-30, 1957

MALYSHEV, I.F.

VEKSLER, V.I.; YEFREMOV, D.V.; MINTS, A.L.; VEYSBEYN, M.M.; VODOP'YANOV;
F.A.; GASHEV, M.A.; ZHYDLITS, A.I.; IVANOV, P.P.; KOLOMENSKIY,
A.A.; KOMAR, Ye.G.; MALYSHEV, I.F.; MONOSZON, M.A.; NEVYAZHSKIY,
I.Kh.; PINTUKHOV, V.A.; RABINOVICH, M.S.; GUBCHINSKIY, S.M.; SI-
NEL'NIKOV, K.D.; STOLOV, A.M.

Ten Bev energy synchrocyclotron built by the Academy of Sciences
of the U.S.S.R. Atom.energ. no.4:22-30 '56. (MLRA 9:12)
(Cyclotron)

MALYSHEV, I. F.

YEFREMOV, D.V.; MESHCHERYAKOV, M.G.; MINTS, A.L.; DZHELEPOV, V.P.;
IVANOV, P.P.; KATYSHEV, V.S. [deceased]; KOMAR, Ye.G.; ~~MA-~~
LYSHEV, I.F.; MONOSZON, N.A.; NEVYAZHSKIY, I.Kh.; POLYAKOV,
B.I.; CHESTNOY, A.V.

Six-meter synchrocyclotron built by the Institute of Nuclear
Problems, Academy of Sciences of the U.S.S.R. Atom.energ. no.4:
5-12 '56. (MLRA 9:12)

(Cyclotron)

TYUL', Yu.; MALYSHEV, I.

Destiny of a great invention. Izobr. i rats. no. 9:23 S '62.
(MIRA 16:3)

(Electric welding)

MALYSHEV, I., shturman dal'nego plavaniya. *long voyage navigator.*

Semicircular deviation coefficient of magnetic compasses under the influence of a weak magnetic field. Mor.flot 15 no.12:10-13 D '55.
(MLRA 9:3)

1. Tiksinskaya gidrobaza.
(Magnetism of ships)

L 48798-65

ACCESSION NR: AP5007258

multiplied by the transfer function; (2) The instantaneous output-signal-power spectrum is equal to the instantaneous input-signal-power spectrum multiplied by the square of the transfer-function modulus. It is observed that the "frequency-discriminator" is actually an "analyzer of the signal present spectrum." Orig. art. has: 1 figure and 25 formulas.

ASSOCIATION: none

SUBMITTED: 08Feb64

ENCL: 00

SUB CODE: DP, IE

NO REF SOV: 003

OTHER: 003

Cord 2/2

08798-65 EWT(H)/EPF(n)=2/EWP(1) Po=4/Pq=4/Pg=4/Pa=2/Pd=4/Pk=4/Pl=4
 TUL(a) Wg/BC

ACCESSION NR: AF5007258

S/0280/65/000/001/0126/0130

AUTHOR: Malyshev, G. V. (Sverdlovsk); Pechorina, I. N. (Sverdlovsk) 58
 6

TITLE: Analysis of the present spectrum of the parametric-circuit signal in an adaptive system

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 1, 1965, 126-130

TOPIC TAGS: automatic control, automatic control design, ¹⁴ automatic control system, automatic control theory, adaptive control system

ABSTRACT: The functioning of the sensing element ("frequency discriminator") is analyzed in an adaptive automatic-control system which adjusts its parameters by measuring its own frequency. The analysis is based on the concepts of the present spectrum and the instantaneous power spectrum introduced by C. H. Page (J. Appl. Phys., 1951, v. 23, no. 1). It is found that in a linear system:
 (1) The present spectrum of the output signal is equal to that of the input signal 7

Card 1/2

Low frequency band ...

32963
S/146/61/004/006/001/020
D249/D301

a uniform characteristic between 0 and 100 c/s and thence, to the output stage. The r.m.s. value of the output voltage is 25 V. This article was recommended by the Kafedra apperatury avtomaticheskogo upravleniya (Department of Automatic Control Equipment). There are 4 figures and 5 Soviet-bloc references.

ASSOCIATION: Ural'skiy politekhnicheskii institut im. S. M. Kirova (Ural Polytechnic Institute im. S. M. Kirov)

SUBMITTED: February 16, 1961

Card 3/3

32963

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D249/D301

Low frequency band ...

provided by the mixer tubes. To examine the effects of the main circuit design parameters, the authors analyze theoretically the modulating action of the mixer. The treatment used is a standard one by means of the Taylor series representation, leading to the well-known result that modulation can be accomplished by a non-linear device, whose power series representation contains a second order term. A further consideration, however, of this second order term shows that a practical noise generator can be constructed if the applied signal bandwidth and the repetition frequency of the local oscillator are suitably chosen. In the actual noise generator a band of frequencies Δf is selected from the thyratron spectrum by a band amplifier having a uniform frequency characteristic between 4500 and 5000 c/s. From the band amplifier the noise voltage passes to the inverting stage and then the two voltages in antiphase are applied to the control grids of two mixer tubes. To the screen grids of the mixer tubes is applied the voltage from the multivibrator, whose frequency is variable over the range Δf . From the load resistance of the two mixer tubes working in the push-pull connection, the voltage passes to the electronic filter which has

Card 2/3

32963
S/146/61/004/006/001/020
D249/D301

6.4311
AUTHORS: Perminov, Yu. A., Malyshev, G. V. and Glyzin, V. I.
TITLE: Low frequency band noise generator
PERIODICAL: Izvestiya vysshikh uchebykh zavedeniy. Priborostroyeniye, v. 4, no. 6, 1961, 3 - 9

TEXT: Design features are discussed of a noise generator for experimental work on computers and automatic control systems. The requirement of this generator is that the output noise voltage should represent a stationary random process following the Gaussian law of distribution and having a uniform spectrum between 0 and 100 c/s. Most of the existing generators utilize the noise from an electron tube, usually the diode. This diode noise voltage is highly amplified to produce sufficient signal at the output terminals. The high degree of amplification required complicates the design and impairs stability. To avoid it, the authors use in the circuit a "noisy" thyatron with a permanent ring magnet and apply the principle of modulation by a non-linear device which in this case is

Card 1/3

Effect of dissociation ...

S/124/62/000/007/014/027
D234/D308

$T_r \ll T_n$. The equations of conservation of substance, momentum and energy for the case of a boundary layer on a plane plate have the same form for both cases. In the case of high velocities of chemical reactions, effective values of physical parameters are used in the equations. The system was solved by numerical methods. The results showed that the dissociation process does not essentially affect the friction of the plate. As long as the temperature does not reach the values at which the air begins to dissociate, the dissociation process has a weak effect on the heat exchange. At a high temperature of the wall, the thermal flow towards it in presence of dissociation is smaller than in case a). The equilibrium temperature of the wall also decreases. Maximum temperature in the boundary layer in the case of dissociation is less than in case a), and there can be essential difference also when the effect of dissociation on the heat flow is still insignificant. The higher the velocity of the incident stream, the stronger is the effect of dissociation. [Abstracter's note: Complete translation.]

Card 2/2

S/124/62/000/007/014/027
D234/D308

24.5200

AUTHORS: Motulevich, V. P. and Malyshev, G. P.

TITLE: Effect of dissociation on heat exchange and friction of a plate in an air stream

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 7, 1962, 73, abstract 7B494 (V sb. Fiz. gazodinamika i teploobmen. M., AN SSSR, 1961, 104-114) ✓A

TEXT: The authors consider a plate in a stream of dissociating gas forming a laminar boundary layer. At sufficiently high velocities of the stream, viscous dissipation of energy can lead to a considerable increase of temperature of the boundary layer, so that gas dissociation can begin within the layer even when the temperature in the undisturbed stream is comparatively low. Two extremum cases are considered: a) When the time of reaction τ_r is much larger than the time of passing of the stream near the wall τ_n , b)

Card 1/2

ALEKHIN, S.V., doktor tekhn. nauk, prof.; GROKHOL'SKIY, N.F.,
 kand. tekhn. nauk, dots.; ZOLOTNIKOV, I.M., kand. tekhn.
 nauk, dots.; KOCHUGOV, P.I., kand. tekhn. nauk, dots.;
 MALYSHEV, G.N., kand. tekhn. nauk, prof.; KHEBNIKOV, M.S.,
 kand. tekhn. nauk, retsenzent; PISAREV, N.G., kand. tekhn.
 nauk, dots., retsenzent; ODING, I.A., kand. tekhn. nauk,
 dots., retsenzent; KURENKOV, I.I., kand. tekhn. nauk,
 retsenzent; PRKOP'YEVA, Ye.I., inzh., retsenzent; YAKOVLEV,
 D.A., inzh., retsenzent; SERGEYEVA, I.N., red.

[Design of technological processes for the manufacture of
 billets and parts for the rolling stock of railroads;
 methodological manual on the technological aspects of di-
 ploma projects prepared in institutions of higher learning
 of railroad transportation] Proektirovanie tekhnologicheskikh
 protsessov proizvodstva zagotovok i detalei podvuzhnykh me-
 stava zheleznykh dorog; uchebno-metodicheskoe posobie po tekhn-
 ologicheskoi chasti diplomnogo proektirovaniia v vuzakh zhe-
 leznodorozhnogo transporta. Moskva, Vses. zapochnyi inzh. in-
 zhenerov zhel-dor. transporta. Pt.1. 1964. 202 p.
 (NIRA 1811)

MALYSHEV, G. N.

Steel

Installation for cold treating of steel. Stan. i Instr., 23, No. 2, 1957.

MONTHLY LIST OF RUSSIAN ACCESSIONS. Library of Congress, June 1957. UNCLASSIFIED.

L 91244-67

ACC NR: AP6032441

0

of their radial position. The width of the rectangles equals the width of the fractional ring. Each rectangle contains 350—380 fibers. The output end of the converter is in contact with the photocathode window of the electron-optical amplifier. By applying sawtooth voltage to the deflector plates of the amplifier, the illuminated rectangle on its screen is resolved in time, and the whole picture displays the wavelength vs. time relations in a square area. Because of obvious losses along the converter's efficiency is evaluated as being no higher than 0.5. The measured efficiency in the case at hand was between 0.16 and 0.19, which is explained by imperfection of the end surface. An incandescent bulb with yellow, green, and blue filters was used as the light source. The results were practically independent of the color filter used. Orig. art. has: 3 figures and 5 formulas. [FP]

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SUB CODE: 20/ SUBM DATE: 03Feb65/ ORIG REF: 003/ ATD PRESS: 5097

hs

Card 2/2

L 01244-67

ACC NR: AP6032441

SOURCE CODE: UR/0368/66/ 005/003/0288/0293

AUTHOR: Malyshev, G. M.; Ptitsyna, Ye. A.

ORG: none

TITLE: Filament image transducer

SOURCE: Zhurnal prikladnoy spektroskopii, v. 5, no. 3, 1966, 288-293

TOPIC TAGS: fiber optics, image transducer, interferometer, Fabry-Perot interferometer, electron ~~optical~~ amplifier, *electron optics*

ABSTRACT: The operating principle of a fiber-optics image converter is described. The device consists of a light filter, a Fabry-Perot interferometer, an image converter, and an electron-optical amplifier. The system makes it possible to utilize light from the greater part of an interference pattern and to obtain a very high time resolution. The image converter consists of glass fibers 45 cm long and 0.1 mm in diameter. The input end of the bunch is mounted in a circular rim 20 mm in inside diameter. The end of the bunch is then sealed and polished. By illuminating diaphragms of various apertures, with the difference between the adjacent apertures corresponding to a selected fraction of the dispersion ring in an interference pattern to be projected on the input end through the interferometer, the fibers conveying light from each ring fraction can be identified. Starting with the smallest aperture the illuminated fibers are arranged in rectangles at the output end in the sequence

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UDC: 535.853

64/B

L 29364-66

ACC NR: AP6018053

Since the parameter α (The Physics of Fluids, no. 8, 1965, p. 208) was calculated to be much smaller than 1, the scattering of laser radiation by electrons was attributed to Thompson scattering. Orig. art. has: 2 figures. [CS]

SUB CODE: 20/ SUBM DATE: 13Jul65/ ORIG REF: 003/ OTH REF: 006/ ATD PRESS: 5008

Card 3/3 *CR*

L 29364-66

ACC NR: AP6018053

$\lambda = 6943 \text{ \AA}$ was 0.5 μsec . The 800-Gc magnetic field was parallel to the discharge axis. The laser radiation was observed at a 90° angle from the incident radiation. This radiation was collected by lens L_3 from a volume 7 mm long and 0.6 mm in diameter into a solid angle of $1/32$ steradian. The discharge tube had a 50-mm diameter. The plasma under investigation was at the center of the discharge tube, 140 mm from the cathode. The laser pulse was activated in the middle of the discharge, the duration of which was several dozen seconds. The pressure of the helium flow in the tube was 0.2 mm Hg. Rayleigh scattering was used to calibrate the system. The slit width of the monochromator was 10 \AA . The experimental results are shown in Fig. 2.

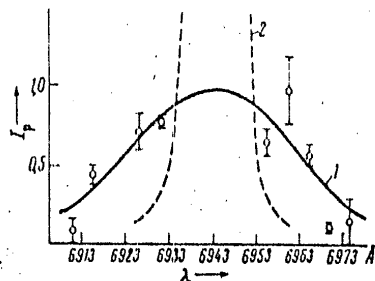


Fig. 2. The curve of the laser radiation scattered by electrons (1) and the curve of parasitically scattered light (2)

The electron temperature determined from the halfwidth of the curve of Fig. 2 was $T_e = 1.8 \text{ eV}$. The electron concentration was determined to be $2.5 \times 10^{13} \text{ cm}^{-3}$.

Card 2/3

L 29364-66 EWT(1)/ETC(f) IJP(c) AT

ACC NR: AP6018053

SOURCE CODE: UR/0020/66/168/003/0554/0555

AUTHOR: Malyshev, G. M.; Ostrovskaya, G. V.; Razdobarin, G. T.; Sokolova, L. N.

ORG: Physicotechnical Institute im. A. F. Ioffe, Academy of Sciences SSSR (Fiziko-
tekhnicheskiy institut Akademii nauk SSSR)

TITLE: Determination of temperature and electron concentration in a plasma arc from
Thompson scattering of laser radiation

SOURCE: AN SSSR. Doklady, v. 168, no. 3, 1966, 554-555

TOPIC TAGS: laser, electron density, plasma arc, ~~Thompson scattering~~, plasma diag-
nostics

ABSTRACT: The temperature and electron concentration in a d-c plasma arc in a mag-
netic field were determined from the scattering of laser radiation. The experimental
arrangement is shown in Fig. 1. The duration of the 25-J ruby laser operating at

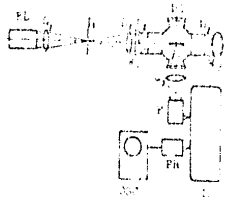


Fig. 1. Experimental arrangement

RL - Ruby laser; L₁, L₂, L₃ - lenses; D₁, D₂, D₃ -
diaphragms; W₁, W₂ - windows; DT - discharge tube;
P - prism; M - monochromator; PH - photomultiplier;
OSC - oscillograph.

Card 1/3

UDC: 533.9.07

L 32635-66

ACC NR: AP6018740

ing the giant pulses of two ruby lasers may be useful in other investigations. The beams from the two lasers were both so deflected through 90° as to cross at right angles. The beam from one laser was focused with a 2.5 focal length lens to produce the spark, and the beam from the other laser was so focused with a 25 cm focal length lens as to shadow the spark region with a magnification of 2 onto a photographic plate. The shadowgraphs showed an almost spherical shock wave expanding from the region of the spark. This shock wave expanded more rapidly along the laser beam that produced the spark than at right angles to it; the rate of expansion of the shock wave decreased with time in approximate agreement with the calculations of A.Sakurai (J. Phys. Soc. Japan, 9, 256, 1954) for a spherical shock wave. Light vertical bands were perceptible on the shadowgraphs. It is suggested that these may be due to shock fronts produced as a result of release of energy at several points along the laser beams. The authors thank V.I.Vladimirov for discussions, and I.I.Komissarova and Ye. L.Burunov for assistance with the work. Orig. art. has: 4 figures. [15]

SUB CODE: 20/

ATD PRESS: 5025

SUEM DATE: 20Nov65/

ORIG REF: 002/

OTH REF: 003

Card 2/2 20

L 32635-66 FBD/EWT(1)/EWP(e)/ENT(m)/EEC(k)-2/T/EWP(k) IJP(c) WH/WG
 ACC NR: AP6018740 SOURCE CODE: UR/0057/66/036/006/1115/1117
 AUTHOR: Yevtushenko, T.P.; Malyshev, G.M.; Ostrovskaya, G.V.; Semenov, V.V.
 ORG: Physicotechnical Institute im. A.F.Ioffe, AN SSSR, Leningrad (Fiziko-tekhnichesk-
 iy institut)
 TITLE: Investigation of a spark in air with the aid of two synchronized lasers
 SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 6, 1966, 1115-1117
 TOPIC TAGS: ruby laser, laser application, spark shock wave, shadowgraph photography
 ABSTRACT: The spark produced in air by focusing the 0.5 J giant pulse from a ruby laser was investigated by casting its shadow with the synchronized giant pulse from a second similar laser. Synchronization of the giant pulses from the two lasers was accomplished by employing the same rotating prism to modulate the regeneration of both lasers. The two lasers were mounted approximately at right angles; one laser viewed the rotating prism directly and the other laser viewed it through a 90° reflecting prism which was mounted above the axis of the first laser. The delay between the two laser pulses was varied from about 30 nanosec to 3-4 microsec by adjusting the angle between the axes of the two lasers. The scatter of the delay times was 20 to 100 nanosec and is ascribed mainly to instability of the 25,000 rpm angular velocity of the rotating prism. It is suggested that this technique for synchroniz-

L 20197-66
ACC NR: AP6007027

ed for blocking out the light from the back surface of the plate. After reflection from mirrors 5, 6, and 7 the light passed through the spark and exposed photographic plate 8, which was protected from daylight fogging by red filter 9. Time delay of the light beam was adjusted by moving mirror 6. The photographs show clearly defined bands surrounding the shadow from the spark plasma. Since the laser emission is nearly totally absorbed by the spark plasma, these bands may be considered a diffraction pattern and the distance between maxima may be used for determining the dimensions of the plasma. Tabulated measurements show that the plasma expands at a rate of about 10^6 cm/sec in the first 100 nsec. "The authors are sincerely grateful to V. V. Semenov and T. P. Yevtushenko who helped in setting up the giant pulse equipment, as well as to A. N. Zaydel for assistance in the work and discussion of the results." Orig. art. has: 2 figures, 1 table. [14]

SUB CODE: 74 20 SUBM DATE: 14Ju165/ ORIG REF: 002/ OTH REF: 001/ ATD PRESS: 4214

Card 3/3

I 20197-66 FBD/EWT(1)/EEC(k)-2/T/EWP(k)/EWA(h) IJP(c) WG
 ACC NR: AP6007027 SOURCE CODE: UR/0051/66/020/002/0374/0375

AUTHOR: Malyshov, G. M.; Ostrovskaya, G. V.; Chelidze, T. Ya.

ORG: none

TITLE: Shadow projections of an air spark generated by focusing a laser beam

SOURCE: Optika i spektroskopiya, v. 20, no. 2, 1966, 374-375

TOPIC TAGS: shadowgraph photography, laser photography, laser R and D, spark camera

ABSTRACT: The authors use the method of shadow projections for photographing a spark produced by focusing a laser beam in air. The shadow projections were photographed in the light emitted by the laser which produced the spark. A delay line was used for taking photographs at various times. A diagram of the experimental setup is shown in Fig. 1. A beam of light 1 from a pulsed ruby laser (energy 0.5 joules, duration 50 nsec) was passed through plane-parallel plate 2 and focused by lens 3 ($f = 25$ mm). The part of the beam reflected from the front surface of plate 2 was used for producing the shadow photographs. Iris 4 with a diameter of 10 mm was used

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UDC: 621.375.9 : 535.004.14

L 16566-66

ACC NR: AP6006959

proposed which, in contrast to the linear part of the characteristic curve, allows one to measure with lesser light losses and over a wider range of exposition changes. Orig. art. has: 5 formulas. [Based on author's abstract]

SUB CODE: 14, 09/ SUBM DATE: 30Nov64/ ORIG REF: 008/ OTH REF: 024/

Card 2/2 vmb

L 16566-66 EWT(1)/T IJP(c)
ACC NR: AP6006959

SOURCE CODE: UR/0368/66/004/002/0105/0111

AUTHOR: Malyshev, G. M.; Razdobarin, G. T.

ORG: none

48
B

TITLE: Photoemulsion sensitivity and its comparison with photocathode sensitivity

SOURCE: Zhurnal prikladnoy spektroskopii, v. 4, no. 2, 1966, 105-111

TOPIC TAGS: photographic emulsion, photocathode, photographic property, photo analysis, light emission, photographic equipment

ABSTRACT: Fluctuation limitations of the sensitivity of a photoemulsion are investigated. Conditions are considered for the minimum of these limitations. The area of a photoemulsion corresponding to minimal losses of the number of quanta at a given precision of their registration is suggested. Estimations are given indicating the growth of light expenditures with the increase of the area used in comparison with that of the optimal one. Comparison of both photoemulsion and photocathode sensitivities is made. It is also shown that with the increase of the range of exposition change a certain deterioration of the photoemulsion sensitivity takes place. A selection of working area of expositions is

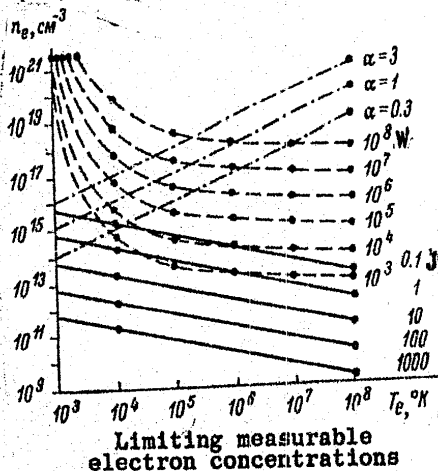
Card 1/2

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2

L 13453-66

ACC NR: AP6002434



(mostly bremsstrahlung) from the plasma itself. The dot-dash lines separate the regions of the diagram in which the ratio $\alpha = \lambda/4 \pi D \sin(\theta/2)$ assumes different values. Here λ is the wavelength of the light, θ is the scattering angle, and D is the Debye radius. When α is small compared with unity the scattering is essentially by free electrons, and the electron concentration and temperature can be measured. When α is large compared with unity the scattering is by electron density fluctuations associated with ions, and the ion temperature can be determined. Advantages of the method include the high space and time resolutions that can be achieved by using narrow beams and short pulses, and the lack of interference with the plasma. In the second part of the paper a

number of experimental investigations are reviewed in some detail. The experimental results confirm the theoretical predictions, and it is concluded that the usefulness of light scattering as a diagnostic tool has been confirmed for both large and small values of α . The method has not achieved the popularity that it deserved, owing, apparently, to the complexity of the apparatus required. More experimental and theoretical work is desirable, and curves and nomographs should be constructed to facilitate reduction of the data. Orig. art. has: 17 formulas and 9 figures.

SUB CODE: 20

SUBM DATE: 16Feb65

ORIG. REF: 008

OTH REF: 027

Card 2/2

L 13453-66 EWT(1)/ETC(F)/EPF(n)-2/EWG(m) IJF(c) WW/GG/AT
ACC NR: AP6002434

SOURCE CODE: UR/0057/65/035/012/2129/2142

AUTHOR: Malyshev, G.M.

ORG: Physico-technical Institute im. A.F. Ioffe, AN SSSR, Leningrad (Fiziko-
tekhnicheskii institut AN SSSR)

TITLE: Plasma diagnosis by scattering of light on electrons

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 12, 1965, 2129-2142

TOPIC TAGS: plasma diagnostics, light scattering, laser, laser application, electron density, electron temperature, ion temperature, *laser beam, laser pulsation*

ABSTRACT: This is a review article (with a bibliography of 35 references) concerned with scattering of light by plasmas, a phenomenon that owes its usefulness for plasma diagnostics to the development of intense laser beams. The theory is reviewed in the first part of the paper, and the limits of applicability of the method for plasma diagnosis are discussed. The conclusions of this section are summarized in the figure which shows the limiting electron concentrations n_e that can be measured at different electron temperatures T_e with laser beams of different intensities. The solid lines show the minimum n_e that can be measured with laser pulses of different energies. This limit is set by the sensitivity of the equipment used for detecting the scattered light. The dashed curves show the maximum n_e that can be measured with laser pulses of different intensities (powers). This limit is set by the intensity of the radiation

Card 1/2

UDC: 533.9

L 13972-65

ACCESSION NR: AP4048759

optical fibers and should be placed between the interferometer and electro-optical converter. Its toroidal end faces the interferometer to receive the incident interference pattern. The fibers should be arranged in a series of bundles in order that each ring forms a band along which the adjacent resolvable wavelengths lie. The resultant pattern will form a rectangle whose axes designate time and wavelength. The resolving power of the proposed apparatus is high and its world significance far reaching. The measure of its effectiveness, which can be derived from expressions for the radii of interference rings and the parameters of the converter, is similar to one designed earlier (G. M. Malyshov and others, ZhTF, 33, 191, 1963).

ASSOCIATION: none

SUBMITTED: 09Mar64

ENCL: 00

SUB CODE: OP, EC

NO REF SOV: 004

OTHER: 001

ATD PRESS: 3133

Card 2/2

L 13972-65 FST(h)/EW(1)/ENA(h) Pn-h/Pac-h/Pab SSI/ASDO(b)/AFMD(t)/AFWL/
ESD/ASD(a)-5/AFETR/RAEM(a)/ESD(c)/RAEM(c)/RAEM(1)/ESD(dp)/ESD(gs)/ESD(t)

ACCESSION NR: AF4048759

S/0051/64/017/005/0799/0799

AUTHOR: Malyshov, G. M.; Ryshkin, A. I. B

TITLE: The possible application of fiber optics in the construction of an apparatus with a Fabry-Perot interferometer and an electro-optical converter 25

SOURCE: Optika i spektroskopiya, v. 17, no. 5, 1964, 799

TOPIC TAGS: fiber optics, spectroscopy, fiber optical scanning, spectral line measurement gm

ABSTRACT: A more effective study of line broadening will be made possible by an apparatus currently under construction which will utilize light reflected from the entire interference pattern rather than portions thereof. This apparatus will comprise a light filter, a Fabry-Perot interferometer, an image converter, and an electro-optical converter. The image converter will transform a two-dimensional annular distribution of intensities in the interference pattern into a one-dimensional distribution. The converter can be made of a bundle of

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ACCESSION NR: AP4012989

measured signal, depending on the size of the noise background. In the case when an emulsion is used, the photometry area determines the type of predominating error, although the fluctuation error is decisive in the majority of cases. Regardless of the radiation receiver employed, the sensitivity of the analysis shows similar dependence on the spectral instrument parameters such as the spectral gap width, dispersion, and area of the dispersing element, so that the dependence of the sensitivity analysis on these parameters is affected primarily by the ratio of the two types of errors. The optimal registration time can be determined from the law of variation of the spectral line as the sample is consumed. Orig. art. has: 14 formulas.

ASSOCIATION: None

SUBMITTED: 26Jul63

ENCL: 00

SUB CODE: OP

NR REF SOV: 009

OTHER: 003

Card

2/2

ACCESSION NR: AP4042989

S/0051/64/017/001/0129/0134

AUTHORS: Zaydel', A. N.; Maly*shev, G. M.; Shreyder, Ye. Ya.

TITLE: On the sensitivity of spectral analysis

SOURCE: Optika i spektroskopiya, v. 17, no. 1, 1964, 129-134

TOPIC TAGS: spectrum analysis, light sensitivity, photometry, photographic emulsion, photoconductive detector

ABSTRACT: The effect of the method used to record the spectrum and of the parameters of the spectral instrument on the sensitivity of a spectral analysis is investigated as a function of the character of the intensity-measurement errors. It is shown that the nature of the errors determines the requirements governing the choice of the spectral instrument and the registration time. The optimal registration time in the analysis of small amounts of substance is estimated. If a photocathode is used as the radiation receiver, the decisive analysis error can be connected either with the features of the measuring circuit or with the fluctuations of the

Card

• 1/2

Spectroscopic investigation of the ...

S/057/63/033/003/005/021
B104/B180

the chamber, giving no information on symmetrical pulsations. There are 2 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskii institut im. A. F. Ioffe AN SSSR,
Leningrad
(Physicotechnical Institute imeni A. F. Ioffe AS USSR,
Leningrad)

SUBMITTED: March 19, 1962

Card 2/2

8/057/63/033/003/005/021
B104/B180

AUTHORS: Berezin, A. B., Zaydel', A. N., and Malyshev, G. M.

TITLE: Spectroscopic investigation of the collective motion of NIV ions in the "Alfa" apparatus

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 33, no. 3, 1963, 291-295

TEXT: The collective motion of ions in a plasma was studied in detail via its contribution to the broadening of the NIV lines ($\lambda = 3479 \text{ \AA}$). The apparatus consisted of a DFC-8 (DFS-8) diffraction spectrograph with inverse dispersion 6 \AA/mm , a spectral line separator, two photomultipliers and a double-trace oscillograph. The intensities of the two halves of the line were measured at different times. From a series of oscillograms it is concluded that the collective motion of NIV ions makes no very great contribution to line broadening, i. e., not more than 20%. The frequency of the observed motion is about 100 kc with an amplitude of a few centimeters at this frequency and an oriented motion velocity of about 10^6 cm/sec . The method only takes account of the contribution of collective motions which are a symmetrical with respect to the axis of

Card 1/2

Spectroscopic measurement of ...

S/057/63/033/002/010/023
B108/B186

results showed that the electron temperature rises with increasing degree of ionization. The considerable deviations from the Maxwellian velocity distribution of the electrons can be explained by the simultaneous emission from ions of different degrees of ionization. Also the varying of the emission with time may affect the results. There are 1 figure and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR,
Leningrad (Physicotechnical Institute imeni A. F. Ioffe
AS USSR, Leningrad)

SUBMITTED: February 23, 1962

Card 3/3

S/057/63/033/002/010/023
B108/B186

Spectroscopic measurement of ...

$$kT_e = \frac{\Delta E_n - \chi_n}{2.3 \left[\lg \frac{I_1}{I_2} - \lg \frac{A_{ki1}}{A_{ki2}} \cdot \frac{\sum_{r=0}^{i-1} A_{tr1}}{\sum_{r=0}^{i-1} A_{tr2}} \frac{f_{ok1}}{f_{ok2}} - \lg \frac{\nu_{ki1}}{\nu_{ki2}} - \lg \frac{E_{n1}}{E_{n2}} - 2 \lg \frac{\chi_H}{\chi_n} - \lg \frac{8.3 \cdot 10^{22} \cdot f_2}{g n f_1} - \lg \frac{kT_e}{\chi_n} \right]} \quad (3)$$

where the subscripts 1 and 2 indicate the spectral lines from ions with a degree of ionization of (i+1) and i, respectively. A_{ki} is the transition probability, f_{ok} the oscillator strength, ν_{ki} the frequency, E_n the excitation potential, I the intensity, χ_H and χ_n the ionization potential of hydrogen and of the given ion, n the main quantum number, ξ_n the number of electrons on the orbit with n . The factor g accounts for photorecombination on shells higher than n , while f_1 and f_2 are corrections for the cross sections of photorecombination and impact ionization. The

Card 2/3

S/057/63/033/002/010/023
B108/B186

AUTHORS: Zaydel', A. N., Malyshev, G. M., and Ptitsyna, Ye. A.

TITLE: Spectroscopic measurement of the electron temperature in the "Alpha" machine

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 33, no. 2, 1963, 200-204

TEXT: The plasma electron temperature in the Alpha machine was determined from the intensity ratio of several pairs of spectral lines pertaining to different degrees of ionization of oxygen, nitrogen, and carbon. The intensity ratios were determined from the time-base sweep of the spectra (resolution 0.3-0.4 μ sec) taken under the conditions (1) $H_2 = 180$ oe, $U = 10$ kv, $n = 350$ pulses and (2) $H_2 = 180$ oe, $U = 15$ kv, $n = 150$ pulses, in a hydrogen plasma ($\sim 1 \cdot 10^{-4}$ mm Hg). The results were evaluated with the formula

Card 1/3

Use of the Fabri-Pérot ...

S/057/63/033/002/009/023
B108/B186

ASSOCIATION: Fiziko-tehnicheskiy institut AN SSSR im. A. F. Ioffe,
Leningrad (Physicotechnical Institute AS USSR imeni A. F.
Ioffe, Leningrad)

SUBMITTED: February 26, 1962

Card 2/2

8/057/63/033/002/009/023
B108/B186

AUTHORS: Malyshev, G. M., Razdobarin, G. T., Sokolova, L. V.

TITLE: Use of the Fabri-Pérot calibration instrument with a monochromator and an electron-optical amplifier for the time-base sweep of a spectrum

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 33, no. 2, 1963, 191-199

TEXT: A method of using a Fabri-Pérot interferometer in recording the contours of spectral lines by means of an electron-optical amplifier is described. The arrangement is similar to that usually employed with a monochromator for preliminary dispersion (DAN SSSR, 145, 4, 768, 1962), but no diaphragm is used behind the outlet slit of the monochromator. Hence the illuminating power of this arrangement is by about one order of magnitude greater than that of the usual combinations of interferometer and monochromator plus photomultiplier. This is proven by corresponding calculation. Testing results are given. There are 6 figures and 2 tables.

Card 1/2

S/120/63/000/001/027/072
E039/E320

AUTHORS: Glazunov, Ye.A., Malyshev, G.M. and Razdobarin, G.T.

TITLE: Use of cylindrical optics to increase the luminosity of spectral apparatus with electron-optical amplifiers

PERIODICAL: Pribery i tekhnika eksperimenta, no. 1, 1963, 116-117

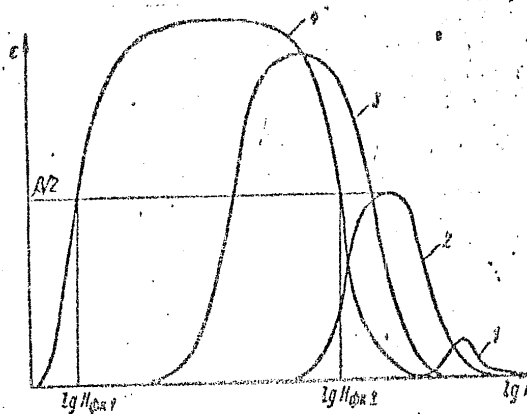
TEXT: Cylindrical optics were used for projecting the spectrum from a ДСФ-8 (DSF-8) spectrograph onto the photocathode of an electron-optical amplifier. Two identical cylindrical quartz lenses were arranged at right-angles to each other so that the first lens increased the spectral dispersion by 8 to 12 times, while the second lens decreased the height of the spectrum by ~ 8 times, i.e. from 12 mm down to ~ 1.5 mm. This enabled the full height of the spectrum to be focused onto the photocathode of the electron-optical amplifier. The apparatus was used for measuring the change in contour with time of the 4047 A line from a ПРК-4 (PRK-4) mercury lamp. A time resolution of 0.1 μ s was obtained. There are 2 figures.

ASSOCIATION: Fiziko-tekhnicheskii institut AN SSSR (Physico-technical Institute of the AS USSR)

SUBMITTED: March 6, 1962
Card 1/1

ACCESSION NR: AT4025293

ENCLOSURE: 0:



Approximate variation of equivalent quantum yield of an electron optical amplifier at different gains κ (curves 2, 3, 4) and equivalent quantum yield of photographic film (curve 1). H_{ϕ_0} — exposure

Card 4/4

ACCESSION NR: AT4025293

1 figure and 8 formulas.

ASSOCIATION: None

SUBMITTED: 19Oct63

DATE ACQ: 16Apr64

ENCL: 01

SUB CODE: OP, NP

NR REF SOV: 011

OTHER: 002

Card 3/4

ACCESSION NR: AT4025293

photocathode if the gain is chosen correctly. The choice of the gain is determined by the number of image elements and the measurement accuracy, which must be reconciled with the number of quanta. For each value of the gain, starting with some limit, there is a definite interval of measurable number of quanta and a corresponding interval within which the quantum yield of the electron optical amplifier is close to its optimal value (the quantum yield of the photocathode). This interval can be determined from the known curve of equivalent quantum yield of the photographic film. If the measured range of exposures is sufficiently broad, this interval becomes somewhat narrower at low gain. It broadens with increasing gain. Too high a gain for a given number of quanta does not make it possible to obtain the necessary number of image elements and the accuracy attainable when the gain is optimally chosen. The noise due to the dark current of an electron optical amplifier is much smaller than the noise of a photomultiplier, and need be taken into account only when the exposure time is very large. Orig. art. has:

Card 2/4

ACCESSION NR: AT4025293

S/0000/63/000/000/0049/0061

AUTHORS: Maly*shev, G. M.; Razdobarin, G. T.

TITLE: Sensitivity of electron optical amplifier

SOURCE: Diagnostika plazmy* (Plasma diagnostics); sb. statey.
Moscow, Gosatomizdat, 1963, 49-61

TOPIC TAGS: electron optical photography, photoelectric emission,
photoelectron multiplier, photoelectrooptical amplifier, photocathode
quantum yield

ABSTRACT: The authors review the choice of optimal sensitivity and gain of electron-optical amplifiers when used for the photography of high-speed processes and conclude that an advantageous receiver sensitivity comparison should be based on their equivalent quantum yields. It is shown that the equivalent quantum yield of an electron optical amplifier can be made close to the quantum yield of the

Card 1/4

ACCESSION NR: AT4025290

$$n_e = 10^3 \frac{m^2 c^6 h d a^3}{e^4 \lambda \Delta \lambda \eta L E_0} \quad \text{and} \quad n_{e \text{ MAX}} = \frac{130}{16 \sqrt{2\pi \ln 2}} \cdot \frac{W_0}{e^2 v l d} \cdot \frac{1}{k_0 \left(\frac{h\nu}{2kT_e} \right)} \exp \left(\frac{h\nu}{2kT_e} \right).$$

for the minimum and maximum measurable electron density, respectively. It is assumed that the threshold of measured light energy is determined by the fluctuations in the number of photoelectrons produced upon scattering, and that the main sources of noise are the plasma intrinsic radiation and the light scattered by the various parts of the apparatus. While the latter cannot be evaluated in general form, an estimate made for a specially constructed small discharge tube shows that the proposed method can yield new data even with currently available equipment. Orig. art. has: 1 figure and 8 formulas.

ASSOCIATION: None

SUBMITTED: 19Oct63

DATE ACQ: 16Apr64

ENCL: 01

SUB CODE: PH

NO REF SOV: 002

OTHER: 004

Card 2/3

ACCESSION NR: AT4025290

S/0000/63/000/000/0031/0035

AUTHORS: Zaydel', A. N.; Maly*shev, G. M.; Ostrovskaya, G. V.

TITLE: Use of laser for quantum diagnostics

SOURCE: Diagnostika plazmy* (Plasma diagnostics); sb. statey.
Moscow, Gosatomizdat, 1963, 31-35

TOPIC TAGS: plasma, plasma diagnostics, plasma diagnostics with
laser, laser, plasma electron density, plasma electron velocity
distribution, plasma noise, ruby laser, light energy threshold,
plasma free electron scattering

ABSTRACT: The range of electron densities and temperatures in which
the scattering of light from a ruby laser by the plasma electrons
can be used to determine the electron density and the electron ve-
locity distribution function is evaluated. The expressions obtained
under some simplifying assumptions are

Card

1/3

The use of an electron optical...

S/O20/62/145/004/011/024
B178/B102

multiplier is $E_{\text{com}}/E_{\text{phm}} = \Psi_{p_m}/n/\Psi_1/n = \sqrt{\frac{1}{2\kappa}}$. The maximum efficiency is attained if the following holds for the slit height: $\beta d_p \geq d_e \sqrt{\frac{2\lambda}{\ln(1/\beta)}}$. The optimum width is calculated from $a_m \leq h/\sqrt{p_m}$. There are 1 figure and 1 table.

ASSOCIATION: Fiziko-tekhnicheskii institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences USSR)

PRESENTED: February 26, 1962, by B. P. Konstantinov, Academician

SUBMITTED: February 15, 1962

Card 2/2

24.3300

40086

S/020/62/145/004/C11/024
B178/B102

AUTHORS: Malyshev, G. M., Pazdobarin, G. T., and Sokolova, L. V.

TITLE: The use of an electron optical amplifier with a Fabry Perot Standard and a monochromator for time sweeps of the spectrum

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 4, 1962, 768-770

TEXT: These instruments make it possible to obtain a time resolution up to $3 \cdot 10^{-12}$ sec and to work with a powerful lens system. The entire height of the slit is focused on the photocathode of the amplifier. The aperture of the monochromator slit must be $\beta = \psi_1 \frac{d_e}{d_p}$ where $\psi_1 = \psi_p/n = 2 \sqrt{\frac{\lambda p}{t n}}$ is the aperture height of the p-th ring, d_e and d_p are the diameters of the interferometer and the grating. The maximum value of p is given by $p_m = \frac{1}{2} \left(\frac{1}{\lambda} \right)$ where $\frac{1}{\lambda}$ is equal to the number of the resolved intervals on the photocathode. The ratio between the energy recorded with an electron optical amplifier, and the energy recorded by a photoelectronic

Card 1/2

Spectroscopic measurements of...

S/057/62/032/003/016/019
3117/B101

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. P. Ioffe AN SSSR,
Leningrad (Physicotechnical Institute imeni A. P. Ioffe
AS USSR, Leningrad)

SUBMITTED: November 23, 1961

Card 3/3

X

Spectroscopic measurements of...

S/057/62/032/003/016/019
B117/B101

and used a two-term interpolation formula $E_i = E_0 + (M_i/M_D)e$ (3) to attain an agreement between experimental and theoretical data. They assumed "thermalization" of the plasma. A calculation of the data given in the paper mentioned, however, showed that the experimental results were described equally well by the interpolation formula (1) with only one parameter as by formula (3) with two parameters. Thus, the investigations conducted on the "Zeta" and "Alfa" plants confirmed that the energy of ions increased with increasing nuclear-charge number. Formula (3) was found to give a deuteron temperature of ~ 100 ev. The mechanism of ionic acceleration by electrostatic fields of plasma waves, which is not impossible for the "Zeta" plant either, presupposes a deuteron temperature below the electron temperature (20 - 30 ev), i.e., near the value of α in (1). There are 1 table and 13 references: 2 Soviet and 11 non-Soviet. The four most recent references to English-language publications read as follows: Ref. 1: R. C. Thonemann et al., Nature, 181, 217, 1958; Ref. 10: B. B. Jones, R. Wilson. Report no. 057 read at the Konferentsiya po issledovaniyam v oblasti fiziki plazmy i upravlyaye-mogo yadernogo sinteza (Conference on Investigations in the Field of Plasma Physics and Controlled Nuclear Synthesis); Salzburg, 1961; A. S. Kaufman et al. Proc. Phys. Soc., 76, 17, 1960; B. Bernstein, R. M. Kulsrud. Phys. Fluids, 3, 937, 1960. X

Caro 2/3

U.S.S.R.
S/057/62/032/003/016/019
B117/B101

26.11.74
AUTHORS: Zaydel', A. N., Konstantinov, O. V., and Malyshev, G. M.

TITLE: Spectroscopic measurements of ionic energies on a "Zeta"-type plant

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 3, 1962, 370 - 372

TEXT: The relationship between ionic energy and nuclear-charge number was checked on the basis of experimental data. A relationship between the ionic charge and the width of spectral lines of these ions had already been established in the first investigation conducted on the "Zeta" plant (Ref. 1, see below). Most of the results were satisfactorily described by the relations $E_i = \alpha z$ (1) or $E_i = \beta z^2$ (2). The data determined recently by Jones and Wilson (Ref. 10, see below) on the same plant concerning energies of ions with different mass and nuclear-charge numbers were explained by stating that the ionic energy as a function of charge was purely accidental. They suggested the following relations:

$$E_i \sim z^2/M_i, \quad E_i \sim M_i, \quad \text{and} \quad E_i = \text{const},$$

Card 1/3

89155

S/057/61/031/002/001/015
B020/B056

Spectroscopic methods of ...

luminescence with respect to time is long-time photographing. An example hereto is the spectrum shown in Fig. 7, which was taken by means of "Al'fa". Among the methods of investigating the time characteristics of line contours during the discharge pulse, the method of splitting spectral lines is mentioned. Mention is made of A. A. Vaynshteyn, I. I. Sobel'man, S. E. Frish, Yu. M. Kagan, V. I. Kogan, V. D. Kirillov, A. B. Berezin, S. Yu. Luk'yanov, and V. I. Sinitsyn. There are 14 figures, 2 tables, and 119 references: 57 Soviet-bloc and 55 non-Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskii institut im. A. F. Ioffe AN SSSR,
Leningrad (Institute of Physics and Technology imeni
A. F. Ioffe AS USSR, Leningrad)

SUBMITTED: September 14, 1960

Card 3/4

3

89155

Spectroscopic methods of ...

S/057/61/031/002/001/015
B020/B056

impurities emitted from atoms and ions, their presence and concentration in the gas, in which the discharge occurs, may be determined. From the ratio between the line intensities, also the degree of ionization of the plasma may be determined. Fig. 1 shows the contours of the line NIV ($\lambda = 3479 \text{ \AA}$) averaged over time and the radial direction by means of the experimental values obtained by L. V. Sokolova in the device "Al'fa". Fig. 2 was obtained on the basis of the spectrogram recorded by the spectrograph VCT-28 (ISP-28), and Fig. 3 on the basis of the spectrogram made by means of the spectrograph $\Delta\phi C-6$ (DFS-6). Fig. 4 shows the optical scheme of an arrangement for measuring the velocity of controlled ion motion. The velocity of plasma ions measured by means of "Al'fa" is given in Table 1. Fig. 5 shows a diagram, from which it may be seen that the main part of light energy belongs to the wavelength range 1100-1400 \AA , which was used for measuring the absolute energy losses by means of thermoluminophores. For this purpose, the monochromator or spectrograph must be calibrated, two pairs of lines being selected for each element (Fig. 6). Further, the ratio between the main quantities of plasma luminescence was dealt with. The most important method of characterizing plasma

Card 2/3

3

24,2120 (1482,1502,1160)

S/057/61/031/002/001/015
B020/B056

AUTHORS: Zaydel', A. N., Malyshev, G. M., and Shreyder, Ye. Ya.

TITLE: Spectroscopic methods of studying a hot plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 2, 1961, 129-166

TEXT: This is a review of articles dealing with spectroscopic studies of a hot plasma within the spectral range of some ten to 7,000 A. Plasma luminescence is characterized by the energy distribution over individual wavelengths, which, in turn, is characterized by the intensity, width, and contours of the spectral line, by the intensity of the continuous spectrum, etc. From the width of the spectral lines, the temperature of the ions, and from the shift of the spectral lines as a result of the Doppler effect, the direction of the controlled ion motion is determined. From the intensity of the spectral lines, the electron temperature in the plasma may be determined. The concentration of the charged particle is determined from the intensity of the continuous spectrum of bremsstrahlung, the contour of lines, as well as the shift of the boundary of the spectral series. On the basis of the intensity of the spectral lines of the

Card 1/1

3

MALYSHEV, G.M.

Report presented at the 1st Int. Conference on Radiation Research in
Dartmouth, New Hampshire, 1-3 September 1961.

2. G. Malyshev, A. M. A. Malyshev, V. Malyshev and V. Malyshev

"Investigation of a Pulse Phenomenon in a Hollow Cathode Discharge"

3. G. Malyshev, A. M. A. Malyshev

"Theory of the Mechanism of Fast Electrons Formed During a Pulsed Pulse
Discharge"

4. A. A. Malyshev, A. M. A. Malyshev, and G. M. Malyshev

"On a Model of the Mechanism of the Formation of the Negative Glow
Discharge in a Hollow Cathode"

5. V. Malyshev, A. M. A. Malyshev

"On the Mechanism of the Formation of the Negative Glow Discharge
in a Hollow Cathode"

6. G. Malyshev, A. M. A. Malyshev, A. M. A. Malyshev, G. M. Malyshev

"On the Mechanism of the Formation of the Negative Glow Discharge"

7. G. Malyshev, A. M. A. Malyshev, V. Malyshev, and G. M. Malyshev

"On the Mechanism of the Formation of the Negative Glow Discharge"

8. G. Malyshev

"On the Mechanism of the Formation of the Negative Glow Discharge"

9. G. Malyshev, A. M. A. Malyshev, V. Malyshev, and G. M. Malyshev

"On the Mechanism of the Formation of the Negative Glow Discharge"

10. G. Malyshev, A. M. A. Malyshev

"On the Mechanism of the Formation of the Negative Glow Discharge"

11. G. Malyshev, A. M. A. Malyshev

"On the Mechanism of the Formation of the Negative Glow Discharge"

12. G. Malyshev, V. Malyshev, A. M. A. Malyshev, and G. M. Malyshev

"On the Mechanism of the Formation of the Negative Glow Discharge"

13. G. Malyshev

"On the Mechanism of the Formation of the Negative Glow Discharge"

14

871160

S/057/60/030/012/007/011
B019/B056

Legend to Fig.9: \mathcal{U} slit, \mathcal{L} lens, Π dividing prism, Φ photomultiplier.

Card 5/5

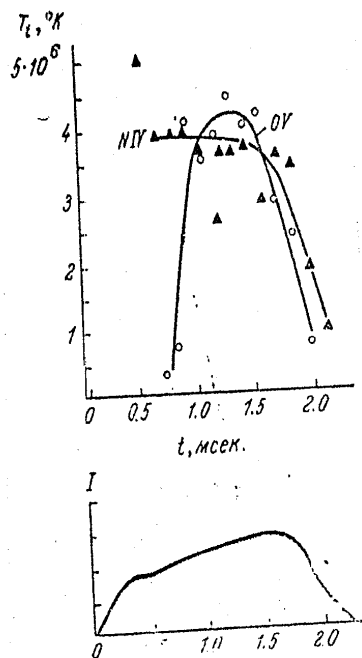


Fig. 3. Зависимость ширины линий NIV 3479 и OV 2781 Å от времени.

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B019/B056

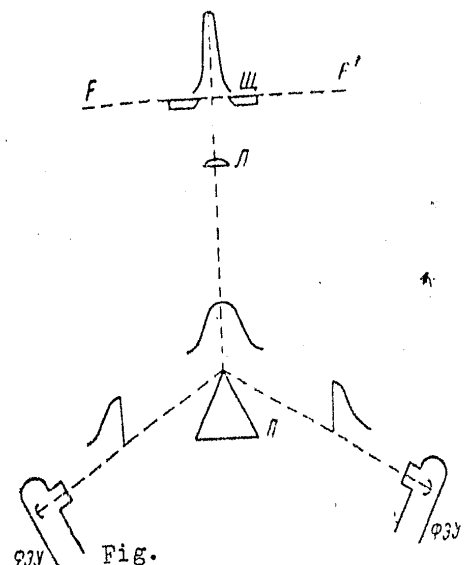


Fig. 9. Схема лазера.

87460

Spectral Examinations With "Al'fa" Research S/057/60/030/012/007/011
Installation. III. Time Characteristics of B019/B056
Plasma Radiation

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Institute of
Physics and Technology of the AS USSR). Nauchno-
issledovatel'skiy institut elektrofizicheskoy apparatury
(Scientific Research Institute of Electrophysical
Apparatus)

SUBMITTED: July 15, 1960

Card 3/5

87460

Spectral Examinations With "Al'fa" Research
Installation. III. Time Characteristics of
Plasma Radiation

S/057/60/030/012/007/011
B019/B056

of time. In the description of the photoelectric method, measurement of spectral line intensity with the aid of a photomultiplier and an oscilloscope is first discussed. By means of a two-beam oscilloscope, the intensity of the spectral line and the discharge amperage were recorded. From the Doppler shift, the authors were able to prove an ordered motion of ions at sufficiently high speeds, and with the aid of a divider shown in Fig.9 for the spectral lines, a shift of spectral lines could be determined with high accuracy. "Al'fa" did not show any difference in the course of intensity of the two halves of the line. Intensity oscillations of the lines having a frequency of 10^5 cps are explained by a Doppler shift and by an ordered motion of the NIV ions along the direction of observation. Laboratory Assistant V. V. Semenov took part in the work. The authors thank B. P. Konstantinov for his interest. There are 10 figures and 5 references: 1 Soviet, 2 Hungarian, 1 British, and 1 Swedish.

Card 2/5

87460

S/057/60/030/012/007/011
BO19/BO56

24,2120

AUTHORS: Zaydel', A. N., Malyshev, G. M., Berezin, A. B., and Razdobarin, G. T.

TITLE: Spectral Examinations With "Al'fa" Research Installation.
III. Time Characteristics of Plasma Radiation

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 12,
pp. 1437 - 1446

TEXT: Two methods are described for recording the time characteristic of plasma: a photographic method with mechanical spectrum scanning, and a photoelectric method. The mechanical scanning of the photographic method was carried out by means of a slitted disk rotating in front of the slit of the spectrograph. The width of the disk slit varied from 0.5 to 2 mm; the speed at which the disk slit moved past the slit of the spectrograph was 5 m/sec. In the studies carried out on this spectrograph it was found that the width of lines changed during the radiation of the plasma. The widths of the NIV and OV lines and the discharge current are both graphically represented in Fig.3 as functions

Card 1/5

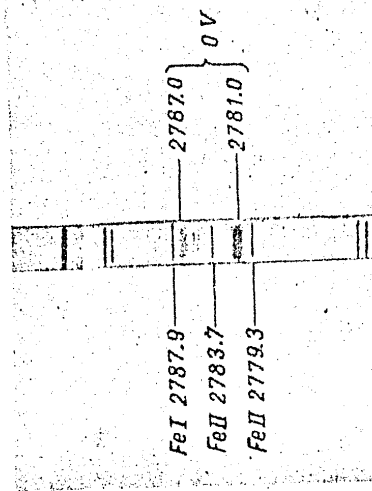


Fig. 3. Участки спектра плазмы, снятые на ФЭС-8.

87659

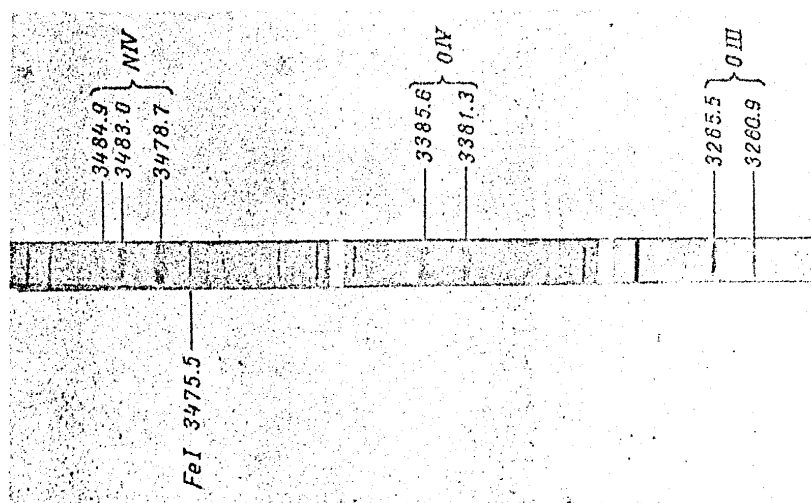
S/057/60/030/012/006/011
B019/B056

Fig. 3

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87459

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B019/B056



Card 4/5

87459
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B019/B056

H_L , арст.		180		360		720	
Ион	U , кВ.	V_H	V_{cp}	V_H	V_{cp}	V_H	V_{cp}
C III	10	—	—	—	—	—	—
	15	—	—	0.5 ± 0.1	—	—	—
O III	10	0.3 ± 0.2	3.1	0.0 ± 0.1	3.4	0.2 ± 0.1	3.4
	15	0.3 ± 0.1	3.4	0.2 ± 0.1	3.3	0.3 ± 0.1	3.5
N IV—O IV	10	0.9 ± 0.1	6.0	0.3 ± 0.1	5.9	0.2 ± 0.1	5.3
	15	0.7 ± 0.1	5.6	0.6 ± 0.1	6.2	0.7 ± 0.1	5.7
O V	10	—	—	—	—	—	—
	15	1.0 ± 0.1	7.0	1.0 ± 0.1	8.4	0.9 ± 0.1	7.3

Table 1

Legend to Table 1: H_L in oe, U is the capacitor voltage in kilovolts, V_H is the velocity of the ions in 10^6 cm/sec units, V_{cp} is the root-mean-square error.

87459

Spectral Examinations With "Al'fa" Research S/057/60/030/012/006/011
Installation. II. Directed Ion Movements B019/B056

3 figures, 1 table, and 5 references: 2 Soviet, 2 US, and 1 Swedish.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Institute of
Physics and Technology of the AS USSR). Nauchno-
issledovatel'skiy institut elektrofizicheskoy apparatury
(Scientific Research Institute of Electrophysical
Apparatus)

SUBMITTED: July 15, 1960

Card 2/5

87459
S/057/60/030/012/006/01'
BO:9/BO56

26.2322

AUTHORS: Zaydel', A. N., Malyshov, G. M., Moskalev, Ye. I.,
Ptitsyna, Ye. A., Sokolova, L. V., and Chashchina, G. I.

TITLE: Spectral Examinations With "Al'fa" Research Installation.
II. Directed Ion Movements

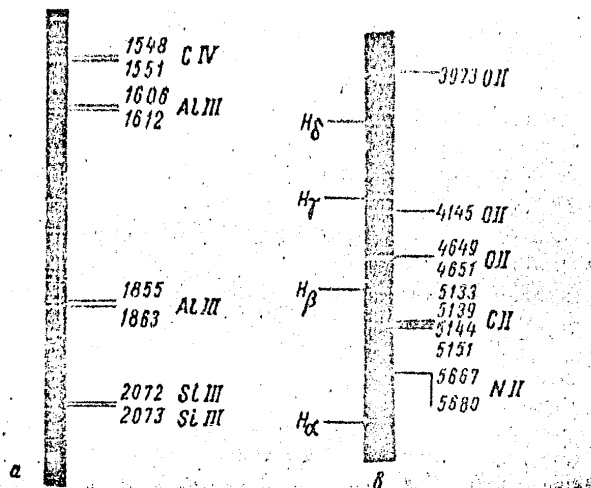
PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 12,
pp. 1433 - 1436

TEXT: Directed ion movements in "Al'fa" were measured by determining the spectral line shift of ions caused by the Doppler effect. The experiments were carried out with a low-dispersion quartz spectrograph and a spectrograph of the type ДФС-8 (DPS-8), having a dispersion of $D = 6 \text{ \AA/mm}$. The pictures were taken in tangential direction and, part of the spectrum is shown in Fig.3. The ion velocities calculated from the line shift and the root-mean-square error are given in Table 1. As may be seen, the velocity of directed ion movement does not exceed 10^6 cm/sec , and increases with increasing ion charge. There are

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S/057/60/030/012/005/011
B019/B056



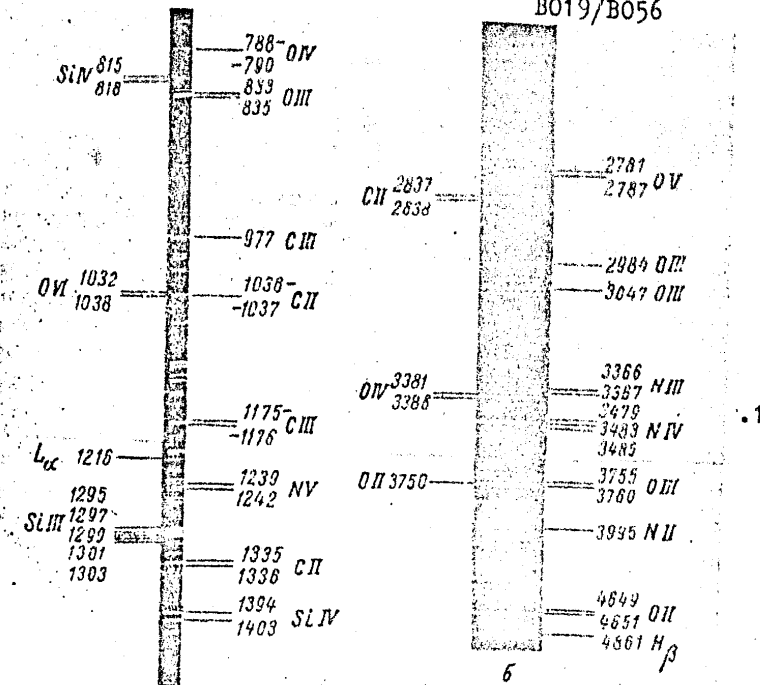
Legend to Fig.1:
The spectrum a was
recorded at $U = 16$ kv,
 $H_z = 180$ oe, b at
 $U = 10$ kv and
 $H_z = 180$ oe and c at
 $U = 5$ kv and
 $H_z = 180$ oe.

Fig.1

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B019/B056



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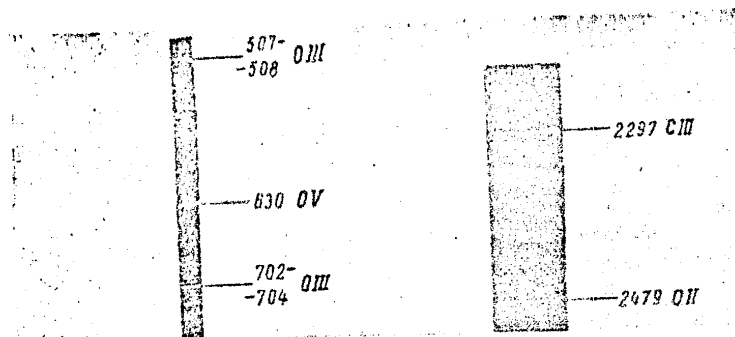
6

87458

Spectral Examinations With "Al'fa" Research S/057/60/030/012/005/011
Installation. I. Study of the Character of B019/B056
the Spectrum and of the Ion Temperature

ASSOCIATION: Fiziko-tekhnicheskii institut AN SSSR (Institute of
Physics and Technology of the AS USSR). Nauchno-
issledovatel'skiy institut elektrofizicheskoy apparatury
(Scientific Research Institute of Electrophysical
Apparatus)

SUBMITTED: July 15, 1960



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Spectral Examinations With "Al'fa" Research S/057/60/030/012/005/011
 Installation. I. Study of the Character of B019/B056
 the Spectrum and of the Ion Temperature

distribution and a pure Doppler broadening of the spectral lines exists. From the data concerning the temperature of the impurity ions obtained herewith it follows that, in dependence on the selection of the lines, from whose broadening the ion temperature is determined with (1), the calculated temperature varies about the range of $0.5 \cdot 10^6 - 15 \cdot 10^6$ °K. The calculated temperature value is the higher, the stronger the charge of the ion according to whose line broadening the temperature has been determined. This indicates an independent motion of the ions of different charges and a non-uniqueness of determining the plasma temperature from the Doppler broadening of the impurity atoms. The authors thank B. P. Konstantinov for discussions and N. I. Kalitayevskiy, A. N. Razumovskiy, and M. P. Chayke for taking part in the work. There are 6 figures, 4 tables, and 7 references: 3 Soviet and 4 US.

Card 2/5

87158

S/057/60/030/012/005/011
B019/B056

24,2120 (1482,1502,1395)

AUTHORS: Zaydel', A. N., Malyshev, G. M., Shreyder, Ye. Ya.,
Berezin, A. B., Belyayeva, V. A., Gladushchak, V. I.,
Skidan, V. V., Sokolova, L. V.

TITLE: Spectral Examinations With "Al'fa" Research Installation.
I. Study of the Character of the Spectrum and of the Ion
Temperature

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 12,
pp. 1422 - 1432

TEXT: The spectrum of the discharge was investigated within the range
of 350-5000 A. The spectrum of 350-2000 A was recorded by a vacuum
spectrograph (600 lines/mm), the optical axis of the instrument was laid
in a radical direction. From 2000 A to 5000 A a quartz spectrograph was
used. Fig.1 shows several spectra recorded by the apparatus. For deter-
mining the ion temperature, the authors used the relation

$T = 1.95 \cdot 10^{12} \mu (\Delta\lambda/\lambda)^2$ (1), on the supposition that a Maxwell velocity

Card 1/5

7 MALYSHEV, G.M.

34 2311
5/057/60/039/012/001/011
2019/2025

AUTHORS: Afrosimov, V. V., Glukhikh, V. A., Golant, V. Ye.,
Zakharov, V. G., Koshentsov, B. P.,
Malyshev, G. M., Malyshev, I. P., Monosov, N. A.,
Stolov, A. M., Fedorenko, M. V.

TITLE: Plasma Studies With "Al'fa" Research Installation
PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 12,
pp. 1391 - 1395

TEXT: A research installation for producing high-power pulsed discharges in a toroidal chamber with an average diameter of 3.2 m and an inner cross-section diameter of 1 m is described. The chamber is filled with hydrogen, and discharge is obtained at a pressure of about $2 \cdot 10^{-4}$ mm Hg. and with an external magnetic field of 180-720 oe. Discharges are produced by 2-3 msec electric pulses coming from a capacitor battery capable of storing $1.5 \cdot 10^6$ joules of energy. The entire installation is shown in a photograph, and is schematically represented in Fig. 2.

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The electric and magnetic characteristics of a plasma discharge are described in detail, after which microwave studies, spectrum analyses, and studies of the atomic flux emitted by the plasma are discussed. The experiments hitherto carried out on "Al'fa" show that the production and character of a discharge do not correspond to the general conceptions of a selfcontracting quasisteady discharge. The authors' forced this opinion owing to the lack of a long plasma column and to the results of microwave studies from the existence of a large azimuthal current, from the asymmetry of discharge, from the occurrence of oscillations therein, and from a considerable inhomogeneity of plasma. Besides, there is an inhomogeneous hydrogen-ion distribution, which is indicated by a large quantity of protons with energies exceeding 10 kev. An explanation of these effects is not possible as yet. There are 8 figures and 22 references: 15 Soviet, 3 Swedish, and 6 US.

Card 24/5

ASSOCIATION: Fiziko-tekhnicheskii institut AN SSSR (Institute of Physics and Technical Sciences of the Academy of Sciences of the USSR), Moscow, USSR
(Scientific Research Institute of Electrophysical Apparatus)

SUBMITTED: July 15, 1960

Card 27/6

ITALYSHEV, G.M.; SKIDAN, V.B.; FRADNIK, E.Ye.; CHAYEN, N.P.

Resolution of a monochromator with photoelectric recording. Opt.
i spektr. 7 no. 6:780-784 D '59. (MIR. 14:2)
(Monochromators)

SOV/51-6-6-26/34

A Photoelectric Spectrometer with a Fabry-Perot Interferometer

order was used in the green region and the 5th order was used in the red region. High angular dispersion of the instrument made it possible to use wide slits and this ensured high speed of the apparatus. To avoid transposition of the diffraction-spectrum orders another monochromator (3) with a constant deviation angle was used between the source of light (4) and the interferometer (2). The light signal from the diffraction monochromator (8) was recorded by means of the photomultiplier, d.c. amplifier and a recording potentiometer EPP-09. Four types of photomultipliers were used: FEU-17 in the blue and green regions, FEU-12 and FEU-14 in the yellow and red regions and FEU-22 for wavelengths longer than 6600 Å. The apparatus described was used to record the hyperfine structure of lines of certain isotopes of lutecium, gadolinium and holmium. Fig 2 shows the record of the hyperfine structure of the holmium line at 5382 Å. A hollow-cathode discharge tube was used as the source of light. There are 2 figures and 6 references, 4 of which are Soviet and 2 French.

Card 2/2

24(7), 24(4)

SOV/51-6-6-26/34

AUTHORS: Kaliteyevskiy, N.I., Malyshev, G.M. and Chayka, M.P.

TITLE: A Photoelectric Spectrometer with a Fabry-Perot Interferometer
(Fotoelektricheskiy spektrometr s interferometrom fabri-pero)

PERIODICAL: Optika i spektroskopiya, 1959, Vol 6, Nr 6, pp 820-822 (USSR)

ABSTRACT: Jacquinet (Ref 1), Chabbal (Ref 2) and Chayka (Ref 3) showed that the speed of a spectrometer with a Fabry-Perot interferometer is much higher than the speed of a similar spectrometer with a diffraction grating. The present paper discusses a photoelectric spectrometer developed at NIFI of the Leningrad State University (Fig 1). High resolving power of the instrument was ensured by a Fabry-Perot interferometer (2 in Fig 1) with dielectric reflecting coatings. 7-layer coatings of TiO_2 and SiO_2 were deposited chemically on this interferometer in T.N. Krylova's laboratory. The interferometer was placed into a hermetically sealed chamber in which the pressure could be varied from several mm Hg to one atmosphere. The uniformity of the scanning rate was ensured by supplying nitrogen from a high-pressure cylinder (~100 atm) through a narrow capillary to the interferometer chamber. Interference rings were focused in the plane of the slit of a diffraction monochromator. A circular diaphragm 1 was used to separate out the required portion of the central interference ring. A diffraction spectrum of the 7th

Card 1/2

[illegible]

Electro-photometer for Recording the Ratio of Two Light Fluxes.

in Fig.1. Fig. 2 gives the basic circuit for recording the ratio of two light fluxes. Fig.3 shows the basic circuit of the applied potentiometer. Fig.4 gives the circuit of the photomultipliers. As an illustration, a recording is included of the change as a function of time of the magnitude of light signals and also of their ratios - Fig.5, p.99; Fig.6 represents a recording of the ratio of two light signals for which the ratio remains constant (Curve 1), but the magnitude of both signals varies (Curve 2). There are 6 figures and 7 references, 6 of which are Slavic.

ASSOCIATION: Leningrad State University imeni A.A. Zhdanov
(Leningradskiy Gosudarstvennyy Universitet imeni A.A. Zhdanova)

SUBMITTED: January 28, 1957.
AVAILABLE: Library of Congress.
Card 2/2

MALYSHEV, G.M.

120-6-25/36

AUTHOR: Malyshev, G.M.

TITLE: Electro-photometer for Recording the Ratio of Two Light Fluxes (Elektrofotometr dlya zapisi otnosheniya dvukh svetovykh potokov)

PERIODICAL: Priory i Tekhnika Eksperimenta, 1957, No.6, pp. 98 - 100 (USSR).

ABSTRACT: An experimental specimen is described of an electro-photometer which records the ratio of two light fluxes. It is based on the use of two photomultipliers, a double-bridge amplifier and an automatic potentiometer as a logometer. The characteristics of the photometer are described. Sokolov (Ref.1) drew attention to the possibility of application of automatic potentiometers as logometers for recording the ratio of two current intensities. G. Pierre and L. Marius (Ref.2) used an ordinary logometer with a double-bridge amplifier for spectro-photometric measures. The Crimea Astrophysics Observatory (Ref.3) used a spectro-photometer for recording of the ratio of two light fluxes in combination with a recording potentiometer. These same principles have been used by the author of this paper, but the apparatus is simplified in as much as standard, Soviet-produced instruments are used throughout. The block schematics of the photometer is shown

Card1/2

Use of a Narrow-Band Amplifier in Oscillo-Graphic Investigation of the Electron Velocity Distribution Functions in an Electrical Discharge. G.M. Malyshev and V.L. Fedorov. Translated from *Doklady Akad. Nauk SSSR* 22, 269-71 (1953). 3p. (NER-12-186)

Methods of investigating the electron velocity distribution function of an electrical discharge through a gas are reviewed. A method is described which allows display, on the screen of an oscillograph, of the whole length of the curve of the second derivative of the probe current taken with respect to the probe potential. A simplified block diagram of the setup is included. Oscillograms are presented of second derivatives of the probe current with respect to the probe potential, which represent the electron velocity distribution functions. Accuracy of the method is discussed. (S.R.)

Leningrad State Univ. in A.A. Udalov

64

U S S R .

✓ Distribution of electrons according to speeds in the electrical discharge of mercury vapors. Yu. M. Kagan and G. M. Malyshov. *Zhur. Tekh. Fiz.* 29, 650-63 (1953).
A report of studies of the form of the distribution function for electron speeds in the mercury vapor discharge at different currents and pressures, at different distances from the cathode.
Gladys S. Macy

MALYSHOV G. M.

Use of a Narrow-Band Amplifier in Oscillographic Investigation of the Electron Velocity Distribution Functions in an Electrical Discharge. G. M. Malyshov and V. I. Fedorov. Translated

✓ 725 450-11-2884
ON METHODS OF INVESTIGATING THE VELOCITY
DISTRIBUTION OF ELECTRONS IN PLASMA. M. M.
Kozlov, G. M. Malyshev and V. L. Fedorov. Translated
from Zhurnal Tekhn. Fiz. 45: 894-903 (1975). (R). Available
from Scientific Technical Translation (ST-1533), Item B,
White Plains, N. Y.

Analysis of existing methods of determining the velocity
distribution of electrons in gas-discharge plasma shows
these methods to be unsatisfactory. A procedure that com-
bines electric and graphic differentiation is proposed.
Evaluation of the errors shows that it is possible to deter-
mine the form of the distribution function with an accuracy
to 10 to 15%. Application of the method shows that elec-
trons in the positive column of a mercury-argon discharge
at a pressure of 0.04 mm mercury and a current of 100 and
250 mA have a Maxwell distribution of velocities. (AUC)

Jan 2 1976

MALYSHEV, G. M.

Malyshev, G. M. -- "An Investigation by the Oscilloscope Method of the Distribution of Electron Velocities in Mercury Discharge." Cand Phys-Math Sci, Leningrad State U, Leningrad 1953. (Referativnyi Zhurnal--Fizika, January 54)

SO: SUM 168, 22 July 1964

MALYSHEV, G. M.

IA 175T14

USSR/Electronics, Discharge in Gases

11 Jan 51

"Method of Investigation of Function of Distribution of Electrons Depending on Velocities in a Gas Discharge," Yu. M. Kagan, V. L. Fedorov, G.M. Malyshev, L. A. Gavallas

"Dok Ak Nauk SSSR" Vol LXXVI, No 2, pp 215-217, 1951

Describes method where curve of 2d deriv, necessary for computation, is obtained directly on oscillograph. Curves proved that the distribution function deviates from Maxwell's function near the cathode.

Doc

MALYSHEV, G.I.; POLYAKOV, V.I.

Power losses in the idle running of electric motors on vibration machines.
Obog. rud 7 no.4:39-41 '62. (MIRA 16:4)
(Vibrators--Electric driving)

MALYSHEV, G.I.

Caries in patients with chronic diseases. Stomatologiya 38
no.3:16-18 My-Je '59. (MIRA 12:8)

1. Iz Mariyskoy respublikanskoy kol'nitsy (glavnyy vrach
A.N.Bogatkina).
(TEETH--DISEASES) (CHRONIC DISEASES)

MALYSHEV, G.I.

Anesthetization of the alveolar process of the upper jaw in the
molar area. Stomatologiya 37 no.4:69 J1-Ag '58 (MIRA 11:9)

1. Iz Respublikanskoy bol'nitsy Yoshkar-Ola (glavnyy vrach A.N.
Bogatkina).
(ANESTHESIA IN DENTISTRY)

KUDUKHOV, I.A.; MALYSHEV, G.I.; SANAKOYEV, T.V.

Improving the spring system in electric vibrating machines.
Obog. rud 9 no.4:33-36 '64. (MIRA 18:5)

MALYSHEV, G.I.

Foreign body (needle) in the alveolar process of the upper jaw
emerging in the nasal cavity. Stomatologiya 37 no.2:70 Mr-Apr '58.
(MIRA 11:5)

1. Iz Respublikanskoy bol'nitsy (glavnyy vrach A.N. Bogatkina) g.
Yoshkar-Ola.

(JAWS--FOREIGN BODIES)

MAIYSHIN, G.A.; YMERESKIY, A.N.

Anticorrosive and decorative coating of pipes with plastics.
Ilast. massy no.3471-72 '64. (MIRA 17:8)

MALYSHEV, Georgiy Andreyevich; BREYTERMAN, Lev Srulevich; ANDREYEV,
P.S., red.; BODANOVA, A.P., tekhn. red.

[Repair of motorbus bodies] Remont avtobusnykh kuzovov. Mo-
skva, Avtotransizdat, 1963. 233 p. (MIRA 16:6)
(Motorbuses--Maintenance and repair)

MALYSHEV, G.A.; YEZERSKIY, A.N.; ZVIRBLYANSKIY, Ya.I., inzh.,
retsenzent; CHERKINSKIY, Yu.S., kand. tekhn. nauk, red.;
VASIL'YEVA, I.A., red. izd-va; SOKOLOVA, T.F., tekhn. red.

[Fundamentals of the design and manufacture of plastic parts
in the automobile industry] Osnovy proektirovaniya i proiz-
vodstva detalei iz plastmass v avtomobilestroenii. Moskva,
Mashgiz. 1963. 231 p. (MIRA 16:9)
(Automobile industry) (Plastics)

MALYSHEV, G., inzh.

Using plastics in repairing motor vehicles. Avt.transp. 40
no.9:27-29 S '62. (MIRA 15:9)
(Motor vehicles--Maintenance and repair)
(Plastics)

MALYSHEV, G.A.

Some means for prolonging the life of motorbuses. Avt.prom. 28 no.8:
29-31 Ag 162. (MIRA 16:3)

1. Moskovskiy avtoremontnyy zavod po remonty kuzovov avtomashin.
(Motorbuses--Maintenance and repair)

MALYSHEV, G., inzh.

Repairing the ZIL and LIAZ-158 motorbuses. Avt.transp. 39 no.12:
44-46 D '61. (MIRA 15:1)
(Motorbuses--Maintenance and repair)

MALYSHEV, G. inzh.

Roll-over stand for washing ZIL-158 and ZIL-155 motorbuses.
Avt.transp. 39 no.2:29-30 F '61. (MIRA 14:3)
(Motorbuses—Maintenance and repair)

MALYSHEV, G.A.

Using plastics in city transportation. Gor.khoz.Mosk. 35 no.6:
32-34 Je '61. (MIRA 14:7)

1. Glavnyy inzhener zavoda "Aremkuz".
(Plastics) (Moscow--Local transit)

MALYSHEV, G.A.

Passenger trailer for the ZIL-158 motorbus. Avt. prom. no. 1:42-43
Ja '61. (MIRA 14:14)

1. Avto-kuzovnoy remontnyy zavod, g. Moskva.
(Motorbus trailers)

MALYSHEV, G.A.

Using plastics in the manufacture of motorbuses. Avt.prom. no.6:
45-47 Je '60. (MIRA 13:8)

1. Zavod "AremkuZ."
(Motorbuses--Design and construction)
(Plastics)

MALYSHEV, Georgiy Andreyevich; YEZERSKIY, Anatoliy Natanovich; CHERKINSKIY, Yu.S., red.; GALAKTIONOVA, Ye.N., tekhn. red.

[Using plastics in repairing motor vehicle bodies] Primenenie plastmass pri remonte kuzovov avtomobilei. Moskva, Nauchno-tekhn. izd-vo M-va avtomobil'nogo transp. i shosseinykh dorog RSFSR, 1960. 110 p. (MIRA 14;10)

(Motor vehicles--Maintenance and repair) (Plastics)

MALYSHEV, G., inzh.

Utilizing plastics in repairing automobile bodies. Avt. transp.
37 no.8:28-29 Ag '59. (MIRA 12:12)
(Automobiles--Bodies) (Plastics)